

ROBINS AFB, GA UTILITY SYSTEM DESCRIPTIONS

General: Robins AFB is located in Houston County and lies immediately east of the City of Warner Robins, approximately 16 miles south of Macon, Georgia. Robins AFB comprises approximately 8,855 acres and, as the State's largest industrial facility, supports approximately 17,000 military and civilian personnel working and living in more than 1,500 buildings requiring utility services. The host tenant at Robins AFB is AFMC Warner Robins Air Logistics Center (WR-ALC).

System Descriptions: The following information provided is only an estimate of the size, scope and general description of the electric, natural gas, potable water and wastewater utility systems at the base and is subject to change.

Electric: The Robins Air Force Base (AFB) Main Base receives electric power from GPC through three 115-kilovolt (kV) transmission lines that feed into the GPC switching station, which then supplies power to the Robins AFB two substations. 115 kV power, received from GPC, is reduced to useable 12.47 kV by two 20-megavolt ampere (MVA) GPC power transformers located at each substation. The power is then fed into the Robins AFB substations main bus structure, which provides power to the feeder breakers. The on-Base power distribution system is monitored by a supervisory control and data acquisition (SCADA) system. The SCADA system will not be transferred under this contract.

At the D Street Substation, the power is distributed to the Base through sixteen 15-kV, 1,200-amp General Electric vacuum circuit breakers. The distribution feeders travel from the substation as underground circuits consisting primarily of 500-MCM copper conductors in concrete encased duct banks, with final load taps being made up with predominantly #2 copper conductors.

At the 9th Street Substation, the power is distributed to the Base through eight 15-kV, 1,200-amp General Electric vacuum circuit breakers. The distribution feeders travel from the substation as underground and overhead circuits. The underground consists primarily of 500-MCM copper conductors in concrete encased duct banks and final load taps being made up with predominantly #2 copper conductors. The overhead circuits consist of both aluminum and copper conductors.

The underground circuits on base equate to an approximate three-phase, four-wire circuit equivalence of 223,814 linear feet (lf). The overhead circuits on Base equate to an approximate three-phase, four-wire circuit equivalence of 62,650 linear feet.

Natural Gas: The natural gas system at Robins Air Force Base (AFB) is connected to two high-pressure sources of natural gas. One is a connection to a gas pipeline owned by Atlanta Gas & Light (AG&L) and the other is a connection to a local distribution company, the City of Warner Robins (City) gas system. Interruptible gas supply is purchased competitively on short-term contracts (usually one-year). Firm gas is purchased under a long-term contract with the City. Natural gas is received from the supplier and reduced to approximately 55 to 60 pounds per square inch gauge (psig) for distribution in the system.

The City has meters in the distribution system on base for distinguishing between firm and interruptible gas sales. The City sells firm gas for on-base residential services and for delivery to the CNG fueling station.

A compressed natural gas station for vehicles was installed in 1995. An outside contractor performs maintenance on this station. Maintenance is currently performed by outside contractors on an "as needed" basis.

The Base can purchase interruptible gas rather than firm gas because of the completion of a propane/air peaking system, which is designed to meet the requirements of the gas system when interruptible transportation or supplies are curtailed. ERI Services constructed, owns, operates, and maintains the propane air system on the Base. The system is designed to provide 400 MMBTU/hour at peak. There are six 60,000-gallon propane storage tanks designed to operate at an 80 percent load factor.

The first sections of the gas system were constructed in the 1950s. The original gas system piping consisted of black iron and steel pipe. Portions of these pipes were abandoned in place and replaced with polyethylene (PE) pipe. New construction is generally PE pipe. The distribution system is looped so that in nearly all locations buildings can be fed from at least two different paths. There are approximately 119 buildings and 763 housing units connected to the base gas system.

The distribution system has 217,000 linear feet (lf) of pipe that is a mixture of coated and wrapped steel, black iron, cast iron, and PE piping. PE pipe comprises approximately 55 percent of the system. Steel mains range in size from ¾ inch to 8 inches in diameter. PE mains range in size from 1 to 8 inches in diameter. Service lines range from ¾ inch to 3 inches in diameter.

The steel piping systems are protected from external corrosion by an impressed current cathodic protection system. A total of 18 rectifiers are installed throughout the Base to protect the gas lines. These protection systems were installed between 1977 and 1980.

There are eight “district” regulator stations located on the system. Seven of these regulator stations reduce the pressure to ~ 35 psig to serve the housing areas. One station at the northeast corner of the Base reduces the pressure to ~ 25 psig. The stations are typically above grade and protected by concrete block walls or fencing. The regulator stations have redundant regulators and bypass loops for protection and to allow for continued operation in the event of a regulator failure.

There are numerous small single regulator installations that reduce the pressure to the desired service pressure for end device use, such as boilers, stoves, and heating units. Each building has at least one regulator. Typical gas pressure for equipment and appliance use in buildings is 7 inches of water to 1 psig. A few buildings are served at higher pressures, such as 5 psig or higher for boiler or process equipment use.

The base has 65 gas meters for measuring gas use as a basis for charging for reimbursable accounts or for new buildings and energy management purposes. One of these meters is located at Robins West; the other meters are on the main Base distribution system.

The City also provides gas to the Robins West (Wherry) Housing Area across Highway 247 from the Main Base, the Museum of Aviation, and the Linwood School. These remote facilities are metered separately and are not included in purchase of this utility.

The City of Warner Robins currently has a high-pressure pipeline that crosses the Base. Atlanta Gas Pipeline has a pipeline that crosses the runway and terminates in the central part of the Base.

Potable Water: The Robins Air Force Base (AFB) water distribution system supplies water for residential and industrial on the Main Base. Construction of the water distribution system infrastructure began in the early 1940s and continues today as the installation grows. The water distribution system consists of approximately 96 miles of distribution pipe ranging from ¾ inch to 30 inches in diameter. Most of the pipe is in the 8- to 12-inch range. Total water storage capacity is 2.7-million gallons (MG).

The water supply is drawn from seven on-Base water wells. An eighth well exists as part of the Robins West housing development, which is not included in the purchase of this utility. Water is being drawn from the Bluffton Aquifer and requires minimal, if any, treatment to meet drinking water standards. Treatment that does occur consists of chlorine injection, fluoridation, lime injection, and polyphosphate. The extraction of groundwater is permitted by the State of Georgia Department of Natural Resources Environmental Protection Division as required by the Groundwater Use Act. The Air Force will retain its Bluffton Aquifer water rights. The contractor is purchasing the distribution system only.

The water distribution system is comprised of several piping materials, including cast iron (CI), ductile iron (DI), polyvinyl chloride (PVC), and asbestos cement (AC). The most prominent pipe types are CI and DI. PVC is also present, but to a lesser extent than DI and CI pipe. AC pipe is uncommon with less than 1,000 feet in place. CI pipe was the original material installed. In the early 1960s, DI pipe installation began and continued into the early 1970s, at which time, PVC pipe installation began.

There are 21 water supply booster pump stations. These booster pumps are assumed dedicated to a facility and therefore not included in the purchase of this utility. There are also four pump stations associated with the fire protection system, which also are not included in the purchase of this utility.

Well water is treated with a combination of four chemicals: fluoride, chlorine, lime, and polyphosphate. Fluoride and chlorine are used for dental hygiene and disinfecting purposes. Lime is added to maintain a particular pH within the water system. Polyphosphate is used to control corrosion within the water distribution system.

A structure with chemical injection capabilities exists at each well location. All of the above chemicals are added mechanically with separate pumps and motors for each individual process. Five of the well facilities also house a generator should a power outage occur.

The water distribution system contains four tanks with a total capacity of 2.5 MG of storage. The system consists of storage for housing and Base facilities. All elevated storage tanks have cathodic protection. No cathodic protection exists on any of the distribution lines.

Sanitary Wastewater: The sanitary wastewater system (sanitary system) serves approximately 17,000 personnel with connections to approximately 1,400 facilities and housing units. The sanitary system consists of 1 operating treatment plant and approximately 60 miles of collection pipe, ranging in size from 2 to 30 inches in diameter.

Most of the pipe is in the 4- to 10-inch-diameter ranges. The sanitary collection system is comprised of several different piping materials, including cast iron, asbestos cement, reinforced concrete, vitrified clay, ductile iron, and polyvinyl chloride (PVC). The majority of the collection piping material (approximately 70 percent) is vitrified clay.

Robins AFB is nearing completion of a five-year collection pipe improvement program to clean, inspect, and repair the sanitary sewer lines. Approximately 30 miles of the estimated 43 miles of aging pipe have been cleaned and inspected through this program. Approximately 180 point repairs have been completed along these sections of pipe. The repairs were noted as point repairs and also include some repairs made for pipe breaks, independent of the program. In some cases, the point repairs were instead full segment repairs. Generally, lines are being repaired by slip lining with high-density polyethylene pipe or with an in-situ liner.

The sanitary sewer treatment facility included in the purchase of the utility has a capacity of 3.3 million gallons per day (mgd). The treatment facility discharges to the National Pollutant

Discharge Elimination System (NPDES) permitted Outfall No. 10, which is then combined with other discharges at a pump station and flows to the Ocmulgee River via a C900, 18-inch-diameter pipeline. This pump station and the sanitary sewer treatment facility serve as a final polishing treatment for the effluent from the Industrial Wastewater Treatment Plant (IWTP) No. 1.

Flows recorded for NPDES compliance for the period of 1 September 1997 through 30 September 1998 indicate an average flowrate of approximately 1.86 mgd. The peak daily flowrate during this period was 4.39 mgd. The peak daily flowrate occurred during a storm event and was attributed to an influx of storm water. High peak flowrates, above the rated plant capacity, occur periodically and are attributable to an influx of water during storm events. These daily peak events have not resulted in NPDES permit exceedances.

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